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AUTHOR Portes, Pedro R.
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ABSTRACT

As part of long term research on the effects of a small, yet intensive, early-age intervention, this study examined the family communication style of 54 mother-child dyads and the scholastic perfomance of the target children. The 19 experimental dyads were of low socioeconomic status and had participated in Project Know How. In this project, children attended a DARCEE program 4 hours a day, 5 days a week, for 2 years and were stimulated by trained staff through verbalization and concept development activities. Their mothers were trained in health, nutrition, and child development skills and were subsequently hired to work in the project. The experimental dyads were compared 10 years later with control dyads of both low and middle socioeconomic status. The communication style of families was assessed through the analysis of parent-child behaviors observed during a semistructured home interview involving the resolution of common parent-child problems. Communication style was found to be a strong predictor of student performance. Early-age intervention was not found to improve student performance as measured by the California Test of Basic Skills, although it was found to develop a more active and participatory communication style. These results were considered in terms of effects on scholastic achievement usually associated with social class and ethnicity, and in terms of current theories about the primacy of linguistic knowledge in cognitive development. (Author/CB)

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Longitudinal Effects of Early-Age Intervention on Family Behavior: Understanding the Role of Social Class and Ethnicity on Adolescent Scholastic Achievement

Pedro R. Portes

University of Louisville

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Running Head: LONGITUDINAL EFFECTS OF EARLY-AGE INTERVENTION

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Abstract

The study examines the effects of early childhood intervention on family communication style and student performance. The communication style of families was assessed through the analysis of parent-child behaviors observed during a semi-structured home interview. It was found to be a strong predictor of student performance. Early age intervention was not found to improve student performance although it was found to develop a more active and participatory communication style in low SES, black and white families. The study also explores the extent to which social class and cultural effects on scholastic achievement can be understood functionally in terms of parent-child communication style. The relation between communication style and the child's intellectual performance is discussed in terms of how verbal processes in the home may affect the child's social and cognitive development. Implications for the design and evaluation of future early childhood interventions are also discussed.

Introduction

After a generation of experimental, educational interventions, renewed interest is emerging in their potential lasting consequences. Although impressive gains in children's intellectual ability were found to be short-lived initially, significant and cost-effective reductions in special education and grade retentions have been found for participants for these programs during their secondary education years. (GAO Report, 1979; Lazar and Darlington 1980; Palmer and Anderson, 1979.) However, the savings afforded by intervention programs represent only one of many objectives considered important in addressing the intertwined and deleterious effects of poverty.

Unfortunately, most critics of compensatory programs (e.g., Mullins and Summers, 1983; Caruso and Detterman, 1981) consider gains in intellectual performance as the only valid measure of program effectiveness. This narrow focus on performance related effects has tended to prevail and overshadow the equally important research problem of identifying and assessing process variables. The latter are important to understand in their potential influence on positive program outcomes relating to health, social and emotional development, family behavior, expectations, attitudes which are relevant to primary prevention. Zigler (1977) considers these to translate into greater social competence, a concept which has gained popularity in this field and affords a broader perspective in the evaluation process.

An important question in the literature concerns the question of

how beneficial program effects may have been brought about. The most comprehensive effort to address this issue stems from research by the Consortium for Longitudinal Studies (Lazar and Darlington, 1982) consisting of twelve early-age intervention programs. Taken as a whole, interventions have served to reduce retention and the need for special education classes with high-risk students, but haven't produced gains in achievement for participants. We have yet to assess the extent to which interventions may have affected other areas relevant to social competence and to understand the change process itself (Lazar et al., 1977).

At present, there is a dearth of information concerning the effects of educational interventions on parent-child behavior. Part of the reason for this stems from the difficulty posed by the quantification of environmental processes. Developmental research has not prized such efforts in the past, nor have there been the methodologies and resources normally necessary to carry out such work. When parental involvement or behavior is examined, most of the data is based on self reports that can distort the estimation of program effects (Hughes and Haynes, 1978, Lytton, 1971). Yet, this is an important research area in that a change in disadvantaged families' immediate environment may relate to the success of various goals of intervention.

Overview of Study

The present report is part of a longitudinal research effort on the effects of a small, yet intensive early-age intervention. It

explores the long-term effects of a family-oriented, early-age program parent-child interaction and student performance. It addresses the following questions: (a) Are the positive outcomes stemming from educational interventions brought about at least in part, by a change in parent-child behavior? (b) Are parent-child behavior patterns of participants different from those of non-participants? And finally, (c) to what extent are parent-child behaviors related to student scholastic success. Although the intervention included only a small sample of participants, its unique experimental design allows for the exploration of social class and cultural effects as well. Within the limitations inherent in working with small samples in longitudinal research, both of those factor's relationships to parent-child interaction are examined along with early intervention.

The study assesses parent-child interaction style from an analysis of semi-structured interviews and the extent to which early intervention affects both communication style and children's school performance over a decade after treatment. Reviews of preschool and compensatory interventions suggest that parental involvement may be the key to beneficial effects on student school performance (Lazar et al., 1979; Mullins and Summers 1983, Rubin et al., Note 4). However, there have been few, if any, studies that examine the longitudinal consequences of intervention on family processes (Portes et al., in press). Follow-up research on early childhood interventions suggests that some programs have achieved a long term, positive effect on disadvantaged children's academic performance (Gray, Ramsey and

Klaus, 1982; Karnes, Plummer and Lee, 1978; Miller and Bizzell, Note 3; Palmer, 1976). However, it is not yet clear how such longitudinal effects were brought about. As Lazar (1977) notes:

> "At this point, then, the evidence does not differentiate between the relative contribution to the effects on school performance of increased intellectual skills in the child and increased parental concern with the child's learning. The positive effect of early education on school performance is now fairly well established, but the mechanism by which it has this effect is still open to conjecture."

It may be that in some, if not all cases, an effect of intervention on family behavior mediates children's scholastic achievement.

In spite of the growing interest in the role of environmental processes on children's development, few studies assess their influence directly. Instead, demographic variables often serve as proxy measures of student's home environment (Scott-Jones, in press, Zussman, 1978) that have limited explanatory value. The present study explores the extent to which the influence of SES and race on student achievement can be understood in terms of differences in parent-child communication style. It compares the unique and shared variance among SES, race and communication style in predicting achievement. The study employs data obtained from the follow-up of Project Know-How (Dunham, Note 1), an anti-poverty, early childhood intervention that focused on both target children and parental involvement through direct training of the mother's interactive

style with the child.

Theoretical Framework

Developmental and educational researchers are examining increasingly the degree to which environmental processes influence children's learning ability and performance (Bausell and Bausell, 1979; Bercovici and Feshbach, 1973; Bradley and Caldwell, 1977; Iverson and Walberg, 1979; Keeves, 1979; Wachs, Uzgiris and Hunt, 1971). Research in this area reflects a range of conceptualizations concerning children's home environment. They are based on the interpretation of structural aspects of the home (Williams, 1976; Zajonc and Markus, 1977; 1982) as well as on descriptions of family behaviors and speech patterns (Bernstein, 1961; Bradley and Caldwell, 1977; Hess and Shipman, 1965; Jones, 1972; Laosa, 1980; Price, Hess and Dickson, 1981). Together, these studies point to the adult-child interaction as a basic mechanism through which environmental factors may influence children's intellectual development. Parent-child communication encompasses a number of different, often interrelated functions which appear relevant to children's opportunities for learning, motivation and use of language. However, it has been difficult to quantify communication processes, particularly in relation to differences in children's intellectual ability.

The adult-child social interaction may be also regarded as instrumental in the ontogenesis of cognitive skills and processes (Vygotsky, 1962). Through verbal communication, the child acquires

information that fosters cognitive growth, comprehension, memory and other facets of learning. Parent-child communication may thus influence differentially the child's intellectual growth (Bernstein, 1971; Moerk, 1976; Wertsch, 1979). However, the manner in which differences in everyday communication style and/or content influence learning remains a critical question in psycholinguistic and cognitive-developmental theory. The present study considers primarily stylistic and child rearing characteristics, both of which can affect types of interaction that support children's cognitive growth.

Method

Subjects

The study employs a sample of 54 mother-child dyads that were identified at the time Project Know-How an early childhood intervention program, began operation in 1967. Sixty low SES families, in groups of thirty, were randomly assigned to treatment and control conditions. An additional middle SES control group (n=30) was also identified at the time using Hollingshead and Redlick (1958) criteria. Each of the three experimental conditions was composed of equal numbers of black and white families. The families were intact, with a healthy child of one year of age and their socio-economic status met the selection criteria of the project.

Children from the 3 groups were administered the Bayley Scales at age two and were not found to be significantly different. The

intervention sought to maintain a normal rate of development for the present high-risk group by involving these children from ages two to four in the following program:

1. The target children participated 4 hours a day, 5 days a week in a DARCEE program for 2 years.
2. Their mothers were trained in health, nutrition and child development skills and subsequently hired to work in the project with other children.
3. The program also employed trained staff to stimulate the child through verbalization and concept development activities (Palmer method, 1976).
4. Voacational guidance and support was provided for father in an effort to maintain stability in the home.

The present sample consists of 19 experimental, and 18 low SES and 17 middle SES control dyads that were located near Tallahassee, Florida. The children were between the ages of twelve and thirteen at the time of follow-up. Attrition was around 33% across groups with slightly more middle SES families moving away from the county. Three black middle SES control families refused to take part in the study. Preliminary examination of school records suggest, however, that history may underestimate treatment effects on intellectual performance. Seven out of eighteen students in the low SES group, as opposed to two out of nineteen students in the

experimental group, participated in Title I programs something that supports earlier findings and which are signigicant using a Chi-square test (p .001). There are approximately equal numbers of males and females in the sample although there is a larger male to female ratio in the experimental group than in the other two control groups. About 60% of the families are still intact in each group. The mothers' ages range from 31 to 45 years of age. The children are all attending schools locally and were in the ninth, tenth and eleventh grades at the time of the study (1979-1980).

Procedure

The 54 dyads were located using the telephone directory, the city directory and school records. They were reached by telephone and asked to participate in the study. Two families were visited directly because they did not have a telephone. The first data set consisted of measures obtained from a semi-structured interview with the mother and child. The interviews were conducted in the families' homes by the experimenter and an assistant. The following instructions were read to the mother and child by the experimenter in order to avoid response bias due to differences in reading level:

> 'Mrs. _____ and _____, I'm going to show you some cards and read them to you. On these cards are some problem situations that could occur in your family. I would like one of you to tell the other how you would solve the problem, and then the other person tell how they would solve the problem. When you have both

given your solutions, I would like you to discuss the problem together and decide on a solution that both of you agree on. I would like you to try to speak to each other and to try to ignore us. Do you have any questions?"

The experimenter answered any questions that were asked. The situations presented described common events appropriate for the child's age group. They were designed to elicit discussion of responses to potentially conflict-provoking but common adolescent, parent-child problems. For example, they were asked to discuss what would most likely occur if the child got into a fight at school or came home with poor grades. Seven 5 X 8 cards, each containing one hypothetical problem, were given to the mother and child, one at a time. The experimenter read the card out loud while the dyad read their card. The experimenter tape-recorded the discussion. The interview lasted, on the average, about half an hour. The experimenter kept silent unless the mother or child asked a question, to obtain clarification on particular statements or to elicit a response when a subject did not respond according to instructions.

Data on the children's school performance was collected concurrently with the interviews. This data set consisted of the students' performance on the California Test of Basic Skills

(CTBS). It provided data on reading, language, math, total battery and reference skills. For the purpose of this paper, only the total battery scores are employed in subsequent analyses.

Interaction Measures

Measures derived from the mother-child interaction task were divided into twoe response categories which are considered representative of family behavior. The first one consisted of the following behaviors that were scored for mother and child separately:

1) Initiator of the discussion for each situation
2-3) Frequency of successful and unsuccessful interruptions by mother or child
4) Frequency of simultaneous speech during the discussion, noting which person prevailed
5) Frequency of cues provided by the experimenter to either mother or child
6) Speech duration total for the mother, child and experimenter

The second response category is based on a revision of an instrument developed by Jackson (1956). Jackson's instrument assesses the parent's disciplinary style and consists of a tally of references made by the mother concerning different childrearing methods employed in the home. References to the following behaviors by the mother were scored from the taped interviews in the study:

a) accepts the child's behavior; is trusting

b) explains, discusses and provides rationales

c) refers to the use of natural consequences (i.e., not being able to go to a friend's house if absent from school)

d) bribes, rewards to obtain compliance

e) reprimands, scolds, berates, loses temper

f) assets authority, orders, demands

g) threatens deprivation, restrictions, love-withdrawal

h) actually deprives, restricts

i) coerces to repeat behavior, induces guilt, shames

j) punishes in ways not otherwise specified

k) physically punishes, spanks, slaps

x) adds information, elaborates about similar situations

z) avoids considering the situation altogether, denies the possibility of the situation arising, is ambiguous in responding

An effort was made to simplify the data since there was considerable overlap in the meaning of the above categories as well as low base rates. A preliminary factor analysis was employed to derive a score for each family that would reflect the disciplinary style used in the home. This was achieved by setting the NFACTORS parameter to yield one factor. This step provided a new measure named JACKSON

that reflected parental disciplinary practices along a democratic-punitive dimension. For example, a high score on the JACKSON measure was associated with maternal acceptance, explanation, and use of natural consequences. A negative score reflected the use of deprivation, assertion of authority and punishment by the parent. A more extensive discussion of this last step is being prepared as a brief report.

Reliability

The reliability for the measures in the first response category was estimated by using Pearson correlations computed from the judgements of two independent raters. The averaged reliability for these measures was .89.

The reliabilities for the Jackson measures was calculated by dividing the number of inter-rater agreements by the number of agreements and disagreements. Two trained judges, working together, examined each interaction and identified maternal statements that were scorable under the Jackson scale and assigned them to the appropriate category. After a training period, a second group of raters examined the interactions of a subset of eighteen families that were representative of the whole sample in terms of experimental condition and race. Their scoring was independent of that of the first group of judges. Several measures had low reliabilities due, in part, to very low base rates (e.g., response frequencies of 1 or 2). The average reliability for the Jackson categories was .76, before they were factor-analyzed to produce one

general measure.

Results

The present study involves the examination of family interaction processes as they are related to early childhood intervention, social class and intellectual performance. In the first section of the study, several measures (including the Jackson factor) obtained from the parent-child interview were factor analyzed in attempting to capture possible underlying types of family behavior. Of these, only eleven measures were retained in the final solution. (See Table 1). The final solution was based on interpretability, simplicity of structure and the magnitude of the loadings associated with each of the variables. In general, three to four factors emerged with eigen values greater than one. However, the first factor consistently captured most of the variability of the variables involved and was considerably more interpretable. The remaining factors accounted for a much lesser proportion of variance, but less than 20% and were not clearly defined. For the above reasons and because of the present sample size, they were excluded from further consideration. Only one general factor was chosen to assess parent-child interaction.

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Insert Table 1 about here

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Assessment of Family Communication Style

A style of parent-child communication where both members

actively exchange information was reflected by the first, general factor. It was named a Participatory Style of Interaction (PSI). Table 1 shows the pattern matrix for the PSI factor. The different loading pertaining to family communication characteristics are described subsequently: The child attempts and often succeeds in interrupting the discussion (.72 & .65 respectively). The child's speech duration is long (.64) and he is likely to ask questions (.60) during the discussion of hypothetical problems. The mother also attempts and succeeds in interrupting the child (.55 of .58 respectively). She makes reference to employing disciplinary methods characterized by acceptance, explanation and the use of natural consequences as opposed to more punitive measures (.53). Although in this pattern of parent-child interaction the mother's speech duration (.41) is relatively less important than the child's (.64), she adds information (.51) and prevails when both persons speak simultaneously (.47). The mother's questioning behavior was of some consequence on the PSI factor (.35).

Scores based on the PSI factor were derived for each mother-child dyad and used in subsequent analyses to represent communication processes in the home. Means and standard deviations for the PSI variable are shown in Table 2, broken down by experimental condition and race. This table also shows statistics for children's school achievement to be discussed subsequently.

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Insert Table 2 about here

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Intervention and SES Effects on PSI

The next step in the evaluation of the family interaction factor was to explore whether early intervention and social class effects were present. The PSI factor was employed as the dependent measure by using factor scores in a two-way analysis of variance by condition and race. The respondent's ethnicity was taken into account to control for an important source of error variance. The results did not reveal a significant interaction for experimental condition and race but showed reliable main effects for experimental condition ($F=9.58$, $p<.0004$) and race ($F=19.46$, $p<.00007$). However, an effect on variability was found to be reliable (F max$=2.32$, $p<.042$). The latter indicated that the untreated, black, low SES dyads were less variable in their communication style than dyads in the other five cells. This result suggests that early age intervention had a long-term effect on black experimentals' style of communication in terms of variability. In terms of central tendency, the results show that the middle SES group has a more participatory style of interaction than the untreated, low SES group ($t=3.7$, $p<.001$) and to a lesser extent, than the low SES treated group ($t=1.8$, $p<.06$). Experimentals had higher PSI scores than the low SES control group ($t=1.9$, $p<.06$). White dyads, in general, were found to be more participatory than black dyads. This finding, however, should be interpreted cautiously in light of the noted effect on variability and possible experimental bias.

In sum, these results suggest that the PSI factor characterizes

a pattern of family behavior that may be important in understanding some of the dynamics underlying social class and cultural differences. The results are also important in that they suggest that intervention effects on family processes persist more than a decade after treatment. The findings indicate that early intervention had an intermediary effect on low SES dyads' interactive style, making them more variable and active than those in the low SES control group and more similar to middle SES parent-child dynads.

Intellectual Ability & PSI

It would seem of theoretical relevance to ask to what extent are the effects of experimental condition (i.e., social class and intervention effects) and race on student achievement explained by family interaction style (PSI) as well as the association between the study's measures (see table 3). Table 4 shows the variance explained by experimental condition and race, prior to entering PSI in the prediction equation (Model I) on school achievement. Table 4 also shows the proportion of variance accounted for by experimental condition and race on scholastic achievement after PSI is entered first in the regression equation (Model II). It should be noted that, for both of these models, the interaction terms were tested in blocks and not found to be statistically significant ($F < 1.0$). Although some of the interaction terms appear to be of practical significance, their lack of statistical significance and the small sample size preclude any additional interpretation.

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Insert Tables 3 and 4 about here

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The comparison of the two models presented in table 4 shows that the proportion of variance explained by experimental condition and race in scholastic achievement may be attributed partly to differences in family interaction style (PSI). For example, note the decrease in explained variance for the condition and race effects. The proportion of variance explained (R^2) by race in total battery performance is diminished substantially once the effect of PSI is controlled (p .05). The R^2 associated with experimental condition for achievement is also reduced by about 50% once PSI is entered first in the regression equation. These results underline the importance of considering children's pattern of interaction in their home environments when demographic factors are related to intellectual performance. The effect of early intervention on student performance was not found to be significant and is considered in more detail subsequently. It was estimated in a separate analysis that excluded the untreated middle SES subjects.

Finally, it should be noted that the second model represented in Table 4 accounts for 6% of the variance more than the model without PSI. This increase is primarily due to interaction terms containing the PSI factor. Although these interactions were not statistically significant, this increase suggests that a participatory style of family interaction may have differential effects on school

performance depending on the child's social class, ethnic background and history. When only the additive regression model is considered, the inclusion of PSI in the regression equation does not increase the proportion of explained variance in achievement net of experimental condition and race. PSI may thus be conceptualized as representing one behavioral process relevant to what are considered generally to be "direct" effects of social class and race on student achievement.

Discussion

The findings of the study reveal that behaviors observed in the course of a situational interview in the home provide a measure that explains as much variance in student performance as socio-economic status and considerably more than ethnicity. There are at least two general interpretations for this finding. The first concerns methodological issues in relation to the statistical analyses employed. The second is based on theoretical implications in the area of cognitive development.

The present results may be explained in terms of the dependence of family interaction style on social class and ethnicity. As noted earlier, experimental condition and race both were found to affect significantly the communication style of parent-child dyads. It was also noted, by employing a stepwise hiearchical regression approach, that communication style did not contribute significantly towards the prediction of student performance after experimental condition and race were controlled. It may be argued that a participatory

style of interaction (PSI) is an attribute of both of the latter factors. Technically, the relation between PSI and student achievement may be considered spurious. However, while this argument is correct generally, it is not appropriate when the attribute variable is considered to be of theoretical interest or importance. The theoretical relevance of PSI in the present study concerns both the explanation of structural or demographic characteristics in a functional sense, as well as the question of how verbal interaction may affect intellectual development.

The results of the study help explain part of the effects usually associated with demographic factors in terms of observed behavioral characteristics. Variations in scholastic performance that are attributed to social class and cultural factors are shown to be accounted for, largely on the basis of differences in parent-child interaction. These findings are relevant to current views on intellectual development. The cultural deficit hypothesis (Jensen, 1969), for example, suggests that the lower school performance levels of black children are due primarily to heredity. The present results suggest, however, that family communication style may influence children's intellectual performance although it is itself a function socio-economic and cultural conditions to a large extent. The results tend to support the cultural difference hypothesis (Cole & Bruner, 1971). Socio-cultural conditions appear more likely to affect those aspects of communication style related to intellectual development than assumed genotypic differences. If

cognitive and linguistic growth depend on interaction between maturational and environmental processes, and a significant portion of the latter are mediated verbally, then differences in verbal communication would seem more likely to affect measured intelligence in theory (Vygotsky, 1978). In particular, it should be noted that scholastic achievement was not influenced significantly by race, once the families' communication style was statistically controlled. This finding suggests that environmental processes should be examined more carefully before assuming genetic causation in explaining differences in children's intellectual development.

Nevertheless, the present measure of family communication style represents only one, contextual influence on children's intellectual development. Other environmental processes in the home may be identified that relate differences in socialization processes to the child's cognitive growth to an even greater extent. The question of how different environmental factors may affect cognitive development is discussed next.

Another interpretation of the data concerns the relationship between language and thought. The attempt to understand how verbal interaction affects cognitive development requires certain assumptions that, in turn, may reflect different theoretical positions. They will be described briefly in the context of the present results.

The concept-matching view of development (Blank & Allen, 1976; Nelson, 1974) considers language as subordinate, rather than a

prerequisite to concept development. That is, the young child is viewed to use non-verbal meanings acquired during the sensory-motor stage as clues to language rather than using language as clues to meaning. The concept-formation view, on the other hand, stresses the role a child's growing linguistic knowledge has in his cognitive development. According to this view, verbalization may affect cognitive development in that by exposure to words and their functions, "the adult prompts the child to ponder over meanings that, if left to individual experience, would not compare in depth or complexity" (Luria & Yudovich, 1959). The latter position is relevant to the interpretation of the results. It implies that parent-child verbal interaction processes may serve to explain the correlation between PSI and scholastic performance. Differences in communication processes as well as their content may thus account for variations in intellectual ability.

Verbalization has been related to cognitive development only insofar as the content found in verbal interactions is involved (Price et al., 1981). It has been hypothesized that it may affect the development of cognitive processes in terms of style, beyond the actual content found in adult-child interactions (Dickson, 1980). Although both mechanisms may well operate jointly, the present results are interpreted in support of the last hypothesis since the study did not consider the specific content of family interaction directly. It may be that PSI reflects a pattern of verbalization in the home environment that is stable and that cumulatively, affects

the child's development. That is, a greater degree of verbal participation and involvement could expose the child to more information and information-processing skills. Children with high PSI scores are provided possibly with more sophisticated and a wider variety of verbal stimulation during their development. The cumulative effects of a high PSI home environment may thus help children's development of information- processing skills and verbal expression. This may lead them to derive increased benefits from schooling and to perform well in tests of intellectual ability.

Finally, these findings suggest a possible mechanism through which early intervention may affect children's school success. Within the limitations present in the study, it appears plausible that lasting effects on family behavior may mediate, even precede positive effects on intellectual ability. In effect, a change in interaction style may not produce automatically a corresponding effect on intellectual performance, but it may be a condition for achieving positive consequences in future generations of low SES origin children. For already advantaged middle SES populations, interaction style may not appear as important since other processes (e.g. those concerning motivation, expectations and economic opportunities) may play a greater role in determining success. Future intervention programs and research should focus more on familial processes and their relation to lasting effects on children's development. In particular, they should be examined for that small percentage of children who demonstrate above average

intellectual ability relative to those whose environments were not changed or to those not participating intervention. Research in this area also needs to consider a broader range of interaction processes in the home relating to parental expectations, reinforcement style, verbal regulation processes and other factors relevant to children's intellectual and social development.

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TABLE 1

Factor (Pattern) Loadings for

Participatory Style of Interaction (PSI).

TEST	PSI FACTOR
Unsuccessful Interruptions by child	.72
Successful Interruptions by child	.65
Speech Duration by child	.64
Questions by child	.60
Successful Interruptions by mother	.58
Unsuccessful Interruptions by mother	.55
Jackson Measure (childrearing methods)	.53
Addition of Information by mother	.51
Simultaneous Speech, mother prevails	.47
Speech Duration by mother	.41
Questions by mother	.35
Positive Resolutions	.08

TABLE 2

Descriptive Statistics for PSI

and School Achievement by Condition and Race

		EXPERIMENTAL CONDITION					
		LOW SES				MIDDLE SES	
		CONTROL				CONTROL	
				EXPERIMENTAL			
		N = 18		N = 19		N = 17	
		X	SD	X	SD	X	SD
White N = 25	PSI	-.15	.83	.30	.81	1.26	.80
	Total Battery	43	15	45	25	68	28
Black N = 29	PSI	-.78	.24	.27	.74	-.11	.66
	Total Battery	19	15	24	22	59	26

TABLE 3

Intercorrelations among Measures of

Student Scholastic Achievement and Family Characteristics*

	BATTERY TOTAL	PSI	INTERVENTION	SES
PSI	.43			
INTERVENTION	.13 (n.s.)	.33		
SES	.52	.34	--	
RACE	.34	.47	.03 (n.s.)	.01 (n.s.)

*NOTE: The correlations associated with the intervention variable were calculated without the middle SES subjects.

TABLE 4

Prediction of Scholastic Achievement

by Demographic and Functional Measures

Model I		Model II	
Order of Predictors	R^2 Without PSI	R^2 With PSI	Order of Predictors
		.20	PSI (P)
EXP Cond (C)*	.27	.14	C
RACE (R)	.11	.06 (n.s.)	R
C X R	.01 (n.s.)	.00	C X R
	--	.05 (n.s.)	P X C
	--	.00	P X R
	--	.00	P X C X R
TOTAL	.40	.46	

*Note: The effect of experimental condition is reflected by two dummy variables, one of which is contains the SES effect and the other an experimental treatment effect. Although only the former is significant, both dummy variables are entered in one step.